however, only touched the country on the southeast point of New England. One of the ocean steamers that was caught in this storm has forwarded a barograph sheet showing the central depression on the 6th, when a reading of 28.50 inches was reached. This sheet is reproduced on a later page. On the morning of the 5th a report was received from Nassau, Bahama Islands, stating that a disturbance was forming near there. Its path was just half way between Bermuda and North Carolina. No effects from this storm were felt on the Atlantic Coast till the afternoon of the 7th when the observer at Hatteras hoisted his northeast signal. On the morning of the 8th the wind reached 34 miles at Hatteras, and at night the maximum wind was 36 miles at that station. At 9.30 p. m. of the 8th storm northeast signals were hoisted from New York City along the southern New England coast. By 1 p. m. of the 9th the storm had advanced sufficiently to warrant hurricane signals from Montauk Point, Long Island, to Portland, Me. During the afternoon of the 9th a maximum wind of 76 miles was reached at Block Island, which was the highest reported at any land station. On the a. m. of the 10th the storm had lost some energy, and by night it was almost entirely replaced by a high area over Nova Scotia.

*Movements of centers of areas of high and low pressure.*

| Number. | First observed. | | | Last observed. | | | Path. | | Average velocities. | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Date. | Lat. N. | Long. W. | Date. | Lat. N. | Long W. | Duration. | Length. | Daily. | Hourly. |
| High areas. | | ° | ° | | ° | ° | *Days.* | *Miles.* | *Miles.* | *Miles.* |
| I* | | | | | | | | | | |
| II | 2, a. m. | 54 | 108 | 6, a. m. | 46 | 59 | 2,700 | 4.0 | 675 | 28.1 |
| III | 3, a. m. | 49 | 124 | 10, a. m. | 44 | 59 | 3,760 | 7.0 | 536 | 22.3 |
| IV | 7, p. m. | 50 | 126 | 14, a. m. | 47 | 62 | 3,880 | 6.5 | 596 | 24.8 |
| V | 12, p. m. | 54 | 113 | 16, a. m. | 47 | 72 | 1,940 | 3.5 | 554 | 23.1 |
| VI | 15, p. m. | 44 | 124 | 21, a. m. | 36 | 78 | 3,600 | 5.5 | 655 | 27.3 |
| VII | 20, a. m. | 54 | 110 | 26, a. m. | 48 | 55 | 4,100 | 6.0 | 683 | 28.5 |
| VIII | 24, a. m. | 45 | 125 | 30, p. m. | 30 | 89 | 2,930 | 6.5 | 449 | 18.7 |
| Sums | | | | | | | 22,900 | 39.0 | 4,148 | |
| Mean of 7 paths | | | | | | | | | 593 | 24.7 |
| Mean of 39 days | | | | | | | | | 587 | 24.5 |
| Low areas. | | | | | | | | | | |
| I | 1, a. m. | 47 | 106 | 4, a. m. | 47 | 60 | 2,270 | 3.0 | 757 | 31.5 |
| II | 3, a. m. | 51 | 113 | 7, a. m. | 50 | 69 | 2,100 | 4.0 | 525 | 21.9 |
| III | 5, a. m. | 53 | 118 | 9, p. m. | 36 | 102 | 1,940 | 4.5 | 432 | 18.0 |
| IV | 5, a. m. | 26 | 78 | 10, a. m. | 42 | 71 | 1,270 | 5.0 | 254 | 10.6 |
| V | 13, p. m. | 43 | 98 | 16, a. m. | 37 | 74 | 2,020 | 2.5 | 808 | 33.7 |
| VI | 16, p. m. | 50 | 91 | 19, a. m. | 49 | 53 | 1,820 | 2.5 | 730 | 30.4 |
| VII | 17, p. m. | 53 | 104 | 20, a. m. | 47 | 57 | 2,150 | 2.5 | 859 | 35.8 |
| VIII | 19, p. m. | 54 | 110 | 23, a. m. | 46 | 58 | 3,130 | 4.0 | 782 | 32.6 |
| IX | 22, a. m. | 54 | 115 | 26, p. m. | 49 | 71 | 2,430 | 4.5 | 540 | 22.5 |
| X | 26, p. m. | 55 | 111 | 29, a. m. | 52 | 98 | 980 | 2.5 | 392 | 16.3 |
| XI | 26, p. m. | 23 | 84 | 30, p. m. | 48 | 80 | 2,210 | 4.0 | 552 | 23.0 |
| Sums | | | | | | | 22,320 | 39.0 | 6,631 | |
| Mean of 11 paths | | | | | | | | | 603 | 25.1 |
| Mean of 39 days | | | | | | | | | 572 | 23.8 |

*No. VI of August; noted for thirty-six hours only.

The most notable storm of the month was reported near the northwest edge of Cuba p. m. of 26th. An area of high pressure remained nearly stationary off the middle Atlantic Coast for two days and this prevented a rapid development of the storm. By a. m. of 28th the wind had shifted to southeast at Key West, showing that the storm had moved to the southwest coast of Florida. By a. m. of the 29th it had moved to southeast Georgia, increasing rapidly in intensity. By 8 p. m. of the 29th the storm had moved with great rapidity and was central over Lynchburg, Va., which station reported a barometer reading of 29.30 inches. About three hours later occurred the severest storm or "wind-rush" ever experienced in Washington, D. C., a description of which will be found elsewhere. On the a. m. of the 30th the storm had moved to Lower Michigan. Storm and hurricane signals were ordered along the Atlantic Coast in ample time, thus detaining in the harbors along the coast sailing and steam vessels valued in the aggregate at over $7,000,000, some of which might have been lost but for the warning. On board these vessels there were about 1,750 sailors and passengers. A full description of the damage wrought by the storm in Florida and along the south Atlantic Coast will be found under severe storms.

## LOCAL STORMS.

By A. J. HENRY, Chief of Division of Records and Meteorological Data.

The noteworthy features of the month were the severe thunderstorms of the 17th in eastern Pennsylvania and New Jersey, the high easterly winds over northeastern Utah on the night of the 18th, and the very severe West India hurricane of the 29–30th.

Three small tornadoes occurred during the month. No lives were lost and the total loss of property was quite small. The details are given below:

4th.—A severe local storm was reported as having destroyed farm property near Caldwell, Kans. An incipient tornado passed through the suburbs of Yorkville, S. C., at 5 p. m., eastern time; no casualties; property loss about $1,500; path half-mile wide and about 2 miles long; moved to the west. A severe thunderstorm swept over Baltimore and vicinity. Two lives were lost by the capsizing of small boats. The damage to dwellings and other property amounted to about $3,000. A destructive hailstorm passed over Weir City, Kans., at 7 p. m. Press dispatches state that glass valued at $10,000 was broken. Hailstorms were also reported in Missouri on the same date.

5th.—A tornado passed over the small hamlet of Waltersburg, Pa., about 7 p. m., eastern time; 4 persons were injured; property loss about $12,000; path 1,500 feet wide, and from 8 to 10 miles long; moved northeast.

10th.—Violent easterly gales prevailed on the New England coast, and as far south as New Jersey; small craft were wrecked at various points and considerable damage was done to property on the beaches.

16th.—A small tornado passed through the eastern part of Lucas and into Monroe Co., Iowa, on the 16th; further particulars are awaited.

17th.—Violent thunder and hailstorms prevailed throughout eastern Pennsylvania and New Jersey. The property loss was quite heavy, probably not less than $50,000.

18th.—On the evening of the 18th the pressure distribution over the Rocky Mountain Plateau was such as to cause high winds, in some cases attaining the velocity of a gale, over the greater part of northeastern Utah. In Cache, Weber, and Davis counties houses were unroofed, plate glass windows blown in, shade trees, signs, and awnings demolished, and orchards badly damaged. The damage in these three counties, at a conservative estimate, was not less than $75,000. At Ogden, where the wind was particularly severe, there was no rain; in other portions of the area covered by the high winds the rain was light.

19th. Severe local thunderstorms occurred throughout the eastern portion of the Middle Atlantic States on the evening of the 19th.

29–30th.—One of the severest West India hurricanes ever experienced struck the Florida coast at Cedar Keys about 3.30 a. m., September 29. It passed thence to Lake Ontario and the St. Lawrence Valley in twenty-four hours at a rather uniform rate of about 46 miles per hour. As is usual in storms of this class the path of relatively great destruction was quite narrow, not extending over 50 miles at any part of its course.

The storm pursued a northeasterly direction through Florida and Georgia. When near Savannah it seemed to curve slightly to the northward, passing thence almost due north to the St. Lawrence Valley.

The force of the wind varied greatly within quite narrow limits; places 50 to 100 miles on either side of the central path were not exposed to winds of unusual severity. The violence of the storm in the central portion also varied with time and place. The greatest violence was manifested in Florida during the early morning of the 29th. During the daylight hours of the same date, particularly in the afternoon, when the influence of the diurnal change in wind velocity might be expected to accelerate the movement of the storm winds, the violence of the latter seemed to diminish.

The second period of great violence began in Virginia about 9 p. m., and continued until a little after midnight when the storm had reached central Pennsylvania. There was then another lull in the violence of the storm, and a subsequent renewal of intensity during the early morning of the 30th at Syracuse, and other points in Cayuga and Cortland counties, New York.

The rainfall in the center and on the eastern side of the hurricane's path was quite light as compared with that to the westward, and the rainfall in Florida, Georgia, and South Carolina was also light as compared with the fall farther north. The rainfall in a strip of country extending from North Carolina to the southern border of Pennsylvania, probably 100 miles wide and about the same distance west of the storm center, was exceedingly heavy, 5 and 6 inches being recorded at some stations, and 3 to 4 at others. As the storm reached central New York, the rain area spread far to the westward and the violence of the winds diminished.

The form and color of the clouds as observed in Washington during the early part of the storm greatly resembled ground fog driven by a high wind. They were very low, scarcely above the house tops, and of a pure white. With the shift of wind from southeast to south and southwest the form and color of the clouds changed, but the darkness soon became so intense that further observations could not be made. The display of atmospheric electricity was almost continuous, and in the form of broad, diffuse flashes, though not of marked brilliancy or intensity. The flashes were very similar to the well known phenomenon of sheet lightning in summer. There was no thunder at Washington. Thunder and lightning were not observed elsewhere in the storm's path except at a very few places.

The loss of life and property is summarized below:

| State. | Loss of life. | Loss of property. |
|---|---|---|
| Florida | 68 | $2,225,000 |
| Georgia | 25 | 333,000 |
| South Carolina | 5 | 25,000 |
| North Carolina | 0 | 20,000 |
| Virginia | 5 | 695,000 |
| District of Columbia | 1 | 443,000 |
| Maryland | 8 | 500,000 |
| Pennsylvania | 2 | 2,140,000 |
| New York | 0 | 50,000 |
| Total | 114 | $7,031,000 |

## TEMPERATURE OF THE AIR.

[In degrees Fahrenheit.]

The mean temperature is given for each station in Table II, for voluntary observers. Both the mean temperatures and the departures from the normal are given in Table I for the regular stations of the Weather Bureau.

The *monthly mean temperatures* published in Table I, for the regular stations of the Weather Bureau, are the simple means of all the daily maxima and minima; for voluntary stations a variety of methods of computation is necessarily allowed, as shown by the notes appended to Table II.

The *regular diurnal period* in temperature is shown by the hourly means given in Table V for 29 stations selected out of 82 that maintain continuous thermograph records.

The *distribution of the observed monthly mean* temperature of the air over the United States and Canada is shown by the dotted isotherms on Chart IV; the lines are drawn over the Rocky Mountain Plateau Region, although the temperatures have not been reduced to sea level, and the isotherms, therefore, relate to the average surface of the country occupied by our observers; such isotherms are controlled largely by the local topography, and should be drawn and studied in connection with a contour map.

The *highest mean temperatures* were: Yuma, 84.0; Phœnix, 82.9; Key West, 82.0; Jupiter, 80.6; Galveston, 80.2. The lowest temperatures were: Sault Ste. Marie, 51.6; Helena, 51.8; Williston, 52.8; Havre, 52.4; Tatoosh Island, 52.0. Among the Canadian stations the highest were: Kingston, 57.6; Halifax, 58.0. The lowest were: Banff, 43.2; Prince Albert, 45.4.

*As compared with the normal* for September the mean temperature for the current month was in excess in the South Atlantic and Gulf States and the Canadian Provinces. It was deficient on the Atlantic Coast, the Missouri Valley, and Lake Region. The greatest excesses were: Palestine, 3.8; Atlanta, 3.2; Columbia, S. C., 2.6; Phœnix, 2.1. The greatest deficits were: Sioux City, 6.2; Minneapolis, 4.5; La Crosse, 4.9; Helena and Miles City, 4.8; Sault Ste. Marie, 4.4.

*Considered by districts* the mean temperatures for the current month show departures from the normal as given in Table I. The greatest positive departures were: South Atlantic, 1.3; East Gulf, 1.2; West Gulf, 1.7. The greatest negative departures were: Upper Mississippi, 2.9; Missouri Valley, 2.5; northern Slope, 3.2.

The *years of highest and lowest mean temperature* for September are shown in Table I of the REVIEW for September, 1894. The mean temperature for the current month was not the highest on record at any regular station of the Weather Bureau. It was the lowest on record at: La Crosse, 55.5; Rapid City, 56.7; Sioux City, 58.5.

The *maximum and minimum temperatures* of the current month are given in Table I. The highest maxima were: 108, Yuma (15th); 104, Phœnix (4th), Columbia, S. C. (18th), Palestine (5th); 102, Fort Smith (17th); 101, Fresno (6th), Dodge City (8th), and Augusta (18th); 100, Red Bluff (5th), Oklahoma (7th), San Antonio (5th). The lowest maxima were: 68, Tatoosh Island (4th) and Eureka (10th); 70, Point Reyes Light (6th); 72, Sault Ste. Marie (8th); 73, Eastport (11th). The highest minima were: 72, Key West (19th); 71, Jupiter (11th); 62, Tampa (24th); 61, Galveston (28th); 60, Port Eads (frequently). The lowest minima were: 19, Cheyenne (27th); 22, Bismarck (19th); 24, Huron (19th), Lander (27th), Idaho Falls (27th); 26, Williston (19th).

The *years of highest maximum and lowest minimum temperatures* are given in the last four columns of Table I of the current REVIEW. During the present month the maximum temperatures were the highest on record at: Columbia, S. C., and Palestine, 104; Fort Smith, 102; Dodge City and Augusta, 101; Little Rock, 100; Charlotte and Nashville, 99; Raleigh and Chattanooga, 98; Savannah, Atlanta, and Cairo, 97; Lexington, 95; Tampa, 94; Northfield, 90; Fort Canby, 89; Port Angeles, 78. The minimum temperatures were the lowest on record at: Cheyenne, 19; Alpena, 28; Sault Ste. Marie, 29; Buffalo, 35; Amarillo, 38; Little Rock and Memphis, 41; Columbia, S. C., Vicksburg, and Abilene, 42; Shreveport, 45; Palestine, 47; Mobile, 49; New Orleans, 56; Tampa, 62.

The *greatest daily range of temperature and data for computing the extreme and mean monthly ranges* are given for each of the regular Weather Bureau stations in Table I. The largest values of the greatest daily ranges were: Miles City, 50;